

Observation of clinical effect of aspirin combined with oxiracetam in vascular cognitive impairment.

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Abstract

Objective: This paper aims to discuss the clinical effect of aspirin combined with oxiracetam in vascular cognitive impairment.

Method: A total of 100 vascular cognitive impairment patients who were treated in hospitals from Apr 2016-2017 were collected and divided randomly into observation (n=50) and control groups (n=50). The control group was treated with aspirin, whereas the observation group was treated with aspirin combined with oxiracetam. The scores of cognitive impairment grade (MMSE) and activities of daily living (ADL) of the two groups before and after the treatment were observed.

Results: After a four-week treatment, the total clinical rate of the observation group was 90.0%, which was significantly higher than that (68.0%) of the control group (P<0.05). Before the treatment, the ADL and MMSE of the two groups had no statistical significant difference (P<0.05). After a four-week treatment, the ADL score of the observation group was 30.64 ± 2.67 , which was significantly lower than that of the control group (39.11 ± 3.63). The MMSE score of the observation group was 24.32 ± 2.24 , which was significantly higher than that (20.14 ± 2.15) of the control group (P<0.05).

Conclusions: Aspirin therapy combined with oxiracetam can enhance the activities of daily living, relieve hypomnesia, and significantly increase the total clinical effects of vascular cognitive impairment patients.

Keywords: Vascular cognitive impairment, Aspirin, Oxiracetam, Clinical observation.

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Introduction

Vascular Cognitive Impairment (VCI) is a class of clinical syndromes that gradually develops from light cognitive impairment to dementia [1]. Moreover, approximately half of VCI patients are stroke patients. Due to the long course of VCI, patients and their family members could not discover symptoms and receive timely treatment [2]. When patients consult a doctor for severely decreased capacity for activities of daily living and lapse of memory, the disease has already become irreversible and can only be controlled by drugs. However, no single effective drug for VCI has been discovered yet [3,4]. In this experience, aspirin combined with oxiracetam was adopted to treat 100 VCI patients. Results are reported in the following text.

General Information and Methods

General information

A total of 100 VCI patients who were treated in the hospital from Apr 2016-2017 were divided into two groups using a

random number table, each with 50 cases. The control group had 29 males and 21 females, aged 51-82 (66.25 ± 6.18 in average). The course of the disease was 1-4 y, averaging at 2.18 ± 1.12 y. Among them, 35 cases have history of hypertension and 15 cases have history of diabetes. The observation group had 27 males and 23 females, aged 50-83 (67.32 ± 6.54 in average). The course of the disease was 1-5 y, averaging at 2.56 ± 1.42 y. Among them, 33 cases have history of hypertension and 17 cases have history of diabetes.

Inclusion standards: Diagnosed with VCI by head CT or MRI; aged 50-85; haemorrhagic stroke: including subarachnoid and cerebral haemorrhages; all patients have been approved by the Ethics Committee of the Hospital and signed the Informed Consent Form.

Exclusion standards: Disturbance of consciousness; complications with serious heart, liver, kidney, and hemopoietic system diseases; cognitive impairment, such as serious metabolic disturbance and intracranial space-occupying lesions; drug allergy and pregnant and lactating women. The two groups had no significant differences in general information and were comparable (P>0.05).

Methods

Symptomatic treatment was required for both patient groups. Treatments included blood glucose control, hypertension control, and lipid regulation. The control group took 0.2 g aspirin soft capsules orally (Shiyao Group Enbipu Pharmacy Co., Ltd. SFDA approval number H20050299, 0.1 g/particle), twice a day. The observation group was injected with 4 g oxiracetam (Haerbin Sanlian Pharmacy Co., Ltd. SFDA approval number H20060070, 5 ml:1 g) and not given aspirin. The oxiracetam solution was mixed with 0.09% 250 mL sodium chloride injection for the intravenous drip. Both groups were treated for four weeks.

Evaluation standards

Evaluation of clinical effect: High: independent living without other clinical symptoms; moderate: self-caring but with light intelligence, language, and cognitive impairments, and small lapse of memory; low: completely dependent living, accompanied with serious intelligence, language, and cognitive impairments, and poor concentration.

Four-level assessment of ADL: 1 score: independent living; 2 scores: weakened ability of independent living; 3 scores: significantly weakened ability of independent living and heavily dependent on family members and medical staff; 4 scores: loss of activities of daily living and requires care of the family member or professional nursing staff.

Assessment of MMSE: MMSE<9 is determined as serious cognitive impairment, 10<MMSE<20 is moderate cognitive impairment and 21<MMSE<24 is slight cognitive impairment.

Statistical analysis

The statistical analysis of all data was performed using SPSS17.0. Measurement data were expressed by “mean ± SD” ($\bar{x} \pm S$). Intergroup comparison of enumeration data used the t-test for independent samples. Enumeration data were expressed by percentage (%). They were tested by χ^2 and P<0.05 indicated a statistically significant difference.

Results

Clinical effect

After a four-week treatment, the total clinical effect of the observation group was 90.0%, which was significantly higher

than that (68.0%) of the control group (P<0.05). Results are shown in Table 1.

ADL scores and MMSE scores

The two groups had no statistically significant differences in ADL and MMSE before the treatment (P<0.05). After the four-week treatment, the observation group achieved significantly lower ADL scores (30.64 ± 2.67) than the control group (39.11 ± 3.63) but significantly higher MMSE scores (24.32 ± 2.24) compared with 20.14 ± 2.15. The differences in ADL and MMSE between the two groups had statistical significance (P<0.05). Results are listed in Table 2.

Comparison of quality of life between two groups

After the treatment, the observation group showed significantly higher quality of life than the control group (P<0.05). Results are shown in Table 3.

Table 1. Comparison of clinical effects between two groups (n (%)).

Groups	N	High	Moderate	Low	Total
Observation group	50	35 (70.0)	10 (20.0)	5 (10.0)	90
Control group	50	16 (32.0)	18 (36.0)	16 (32.0)	68
χ^2	/	/	/	/	6.471
P	/	/	/	/	0.0116

Table 2. Comparison of ADL and MMSE scores of the two groups before and after the treatment (scores, $\bar{x} \pm S$).

Groups	ADL	MMSE
Observation group (n=50)		
Before	45.19 ± 5.12	15.34 ± 4.13
After	30.64 ± 2.67*#	24.32 ± 2.24*#
Control group (n=50)		
Before	45.28 ± 5.45	15.32 ± 4.29
After	39.11 ± 3.63*	20.14 ± 2.15*

Note: *P<0.05 means statistically significant differences between before and after the treatment. #P<0.05 indicates statistically significant differences between the observation and test groups.

Table 3. Comparison of the quality of life between the two groups.

Groups	Family role	Physical strength	Emotion	Social role	Self-care	Total
Observation group (50)	3.26 ± 0.72	3.67 ± 0.62	4.16 ± 0.56	3.28 ± 0.24	3.17 ± 0.77	18.78 ± 2.55
Control group (50)	2.91 ± 0.53	3.01 ± 0.55	3.83 ± 0.38	2.63 ± 0.38	2.81 ± 0.48	15.23 ± 1.84
T	2.537	5.161	2.941	9.373	2.571	7.316
P	0.013	0	0.004	0	0.012	0

Discussion

VCI is a disease with stroke basis and has a causal relationship with cognitive impairments. Memory is relatively maintained or damaged slightly, whereas the attention and executive functions are destroyed significantly [5]. The course of the disease develops in a fluctuating manner. No unified international standard on the diagnosis of VCI has been reached yet, thereby complicating the discovery of non-dementia cognitive impairments. The concept of VCI can cover all the degrees of cognitive impairments related to vessel risk factors and cerebrovascular diseases, and can facilitate early diagnosis and intervention to effectively relieve dementia [6]. Patients with VCI suffer damages in mitochondria and blood vessels. Patients have significantly low blood perfusion than healthy people and suffer from serious brain damages. VCI is a class of syndromes that evolves gradually. Initially, patients only show slight cognitive impairments or lapse of memory. However, the disease develops gradually, becomes irreversible, and ends in senile dementia, with reduced blood supply and progression of cerebral parenchymal damage [7].

Approximately half of stroke patients may suffer from VCI. After stroke, the patient's living ability decreases and he becomes insensitive to physical changes. Moreover, early symptoms are not obvious and most patients only seek treatment after the irreversible dementia, in which serious injuries of blood vessel and serious blood supply problems are observed, thereby resulting in significant changes in brain parenchyma [8]. Therefore, effective early diagnosis and intervention of VCI can afford extended treatment time for patients. Delaying the rapid deterioration of blood vessels and brain parenchyma is the key of VCI treatment. Due to the diversified etiological agents, involvement of multiple path mechanism of molecules, cell changes, and poor target effect of drugs, no single drug for relieving the symptoms has been discovered yet. Furthermore, the combined use of drugs was thought to improve therapeutic effects [9]. Therefore, multiple drugs were used in this experiment to discuss combined clinical effects.

Aspirin is a new drug that is used to interdict brain ischemic injury and recover blood supply in some regions. It has significant therapeutic effects in the early treatment of cerebral infarctions and has been applied in clinics for years. Aspirin can significantly improve nervous deficits caused by cerebral ischemia. The main mechanism is that [10]: (1) aspirin can increase the hemoperfusion area, improve cerebrovascular microcirculation, avoid further brain parenchymal injuries, relieve encephaledema, and prevent the rapid rise of intracranial pressure; (2) it can decrease arachidonic acid in patients' bodies and interdict the metabolism and transformation of esters, thereby reducing the Ca^{2+} carriers. The channels for the drainage of Ca^{2+} from the calcium are closed, thereby reducing intracellular Ca^{2+} concentration and improving cognitive function to some extent. Oxiracetam is a new generation of γ -lactam drug for improving cerebral functions. Its main mechanism is: (1) it can penetrate the blood brain barrier quickly and act on the nervous centralis of the

patients to activate brain cells in corresponding regions; (2) it can combine with protein kinases organically to improve the depolarization frequency of memory neurons and enhance the cognitive and memory functions of patients; (3) it can strengthen plasticity changes in the brain and prevent further blood vessel injuries, thereby resulting in irreversible senile dementia. According to the analysis of our results, the observation group that treated with aspirin combined with oxiracetam achieved significantly lower ADL scores, far higher MMSE scores, and higher total clinical effects (90.0% vs. 67.5%), compared with the control group that treated with aspirin only ($P < 0.05$).

Conclusion

In brief, the combined use of aspirin and oxiracetam for VCI not only can enhance activities of daily living, delay lapse of memory, and increase total clinical effect significantly, but is worthy of application in clinics.

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